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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/317,056	05/24/1999	YASUTAKA NAKASHIBA	NEYM16.133	8595

7590

08/09/2004

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EXAMINER

GENCO, BRIAN C

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 08/09/2004

19

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/317,056

Applicant(s)

NAKASHIBA, YASUTAKA

Examiner

Brian C Genco

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,6,9,10 and 13-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6,9,10 and 13-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

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Applicant's amendment filed May 24, 2004 has been fully considered by the Examiner but is not deemed persuasive.

Examiner thanks Applicant for the addition of Fig. 12 so as to clearly illustrate the claimed subject matter. As such, the drawing objections previously presented are herein withdrawn.

Applicant argues that potential barrier under clear gate 8 in Kawahara is not maintained between the overflow drain and photo-electric conversion unit.

In response, Examiner notes Merriam Webster's Collegiate Dictionary wherein the term between is defined as "in the time, space or interval that separates". As clearly shown in Figs. 4A-4G both potential barriers 5 and 8 are between the overflow drain element 2' and the photoelectric conversion element 1, namely it is "in the ... space or interval that separates" elements 2' and 1. As such, as broadly as claimed the Kawahara reference still reads on the claim limitations as illustrated bellow.

Examiner concedes that the Kawahara reference and the instant invention are different, however, Examiner notes that Applicants further arguments with regards to the Kawahara reference and the differences between it and the instant invention are moot in view of not being arguments directed towards claimed limitations.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 9, 10, 13, 14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 4,696,021 to Kawahara et al.) in view of (Applicant's admitted prior art).

In regards to claim 1 Kawahara et al, herein Kawahara, discloses a method for driving a solid-state image pickup device which stores, in a plurality of photo-electric conversion units (element 1 of Fig. 1A), signal charges corresponding to an incident light during a prescribed time period, each of said photo-electric conversion units being provided with an overflow drain (OFD) structure (e.g., elements 2 and 2' of Figs. 2B and 4A-4G), excludes surplus charges from said photo-electric conversion units by an electric potential barrier (e.g., electric potential barrier 8 excludes surplus charges by removing them to the OFD 2' as shown in Fig. 4E by excluding charges above a saturation level set by the voltage V_1 wherein the charges are from said photo-electric conversion unit element 1; column 6, lines 3-19), said electric potential barrier being maintained between said OFD structure and each of said photo-electric conversion units (Examiner notes that the electric potential barrier 8 is situated between the photoelectric conversion unit element 1 and the OFD structure 2'), reads out said signal charges by grouping said photo-electric conversion units into a prescribed number of regions (e.g., 1 region in this case wherein the charges are read out via the vertical transfer CCD), and outputs image signal from all of the photo-electric conversion units by repeating the read-out procedures, which comprises the steps of:

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raising up said electric potential barrier (e.g., as shown in Figs. 4F and 4G the electric potential barrier 8 is raised up);

starting reading out said signal charges (e.g., column 6, lines 24-30).

Kawahara does not disclose "cutting off said incident light by a cut off means such as a mechanical shutter," however, as the Applicants admitted prior art discloses the use of a mechanical shutter to cut off incident light before reading out the signal charges (page 3, lines 13-16) for the very well known and established reason of eliminating the continual build up of excess charge by the photo-electric conversion units. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have used Applicants admitted use of a mechanical shutter in Kawahara's invention in order to eliminate the continual build up of excess charge by the photo-electric conversion units.

Alternatively, Kawahara discloses a method for driving a solid-state image pickup device which stores, in a plurality of photo-electric conversion units (element 1 of Fig. 1A), signal charges corresponding to an incident light during a prescribed time period, each of said photo-electric conversion units being provided with an overflow drain (OFD) structure (e.g., elements 2 and 2' of Figs. 2B and 4A-4G), excludes surplus charges from said photo-electric conversion units by an electric potential barrier (e.g., electric potential barrier 5 excludes surplus charges from said photo-electric conversion unit as shown in Fig. 4G wherein the charges are from said photo-electric conversion unit element 1; column 6, lines 24-37), said electric potential barrier being maintained between said OFD structure and each of said photo-electric conversion units (Examiner notes that the

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electric potential barrier 5 is situated between the photoelectric conversion unit element 1 and the OFD structure 2'), reads out said signal charges by grouping said photo-electric conversion units into a prescribed number of regions (e.g., 1 region in this case wherein the charges are read out via the vertical transfer CCD), and outputs image signal from all of the photo-electric conversion units by repeating the read-out procedures, which comprises the steps of:

raising up said electric potential barrier (e.g., as shown in Figs. 4F and 4G the electric potential barrier 5 is raised up);

starting reading out said signal charges (e.g., column 6, lines 24-30).

Kawahara does not disclose "cutting off said incident light by a cut off means such as a mechanical shutter," however, as the Applicants admitted prior art discloses the use of a mechanical shutter to cut off incident light before reading out the signal charges (page 3, lines 13-16) for the very well known and established reason of eliminating the continual build up of excess charge by the photo-electric conversion units. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have used Applicants admitted use of a mechanical shutter in Kawahara's invention in order to eliminate the continual build up of excess charge by the photo-electric conversion units.

In regards to claim 2 applicant admits, on the 4th page of the Information Disclosure Statement filed March 14, 2002, that "how much of an overflow barrier OFB potential barrier difference to secure is nothing more than a design matter that can suitably be determined by one skilled in the art according to the properties, etc. of the

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solid-stage pickup element that is used.” According to this teaching it is only a matter of design choice to increase the potential barrier difference “by a voltage greater than 0.4 V” according to “the properties, etc. of the solid-stage pickup element that is used.”

In regards to claim 9 see examiners notes on the rejection of claim 1. Kawahara discloses a horizontal overflow drain as shown in Figs. 4A-4G under elements 2 and 2’.

In regards to claim 10 see examiners notes on the rejection of claims 2 and 9.

In regards to claim 13 Kawahara discloses the method for driving a solid-state image pickup device according to claim 1,

wherein said signal charges are read out from said photo-electric conversion units though signal read-out portions (e.g., signal charges are read out from the photoelectric conversion units through transferring them to the vertical transfer CCD via potential barrier 5) and the electric potential of said electric potential barrier during the read-out step is deeper than an electric potential which is applied in signal read-out portion during the times except said read-out step (e.g., referring to the alternative rejection above wherein the potential barrier was defined as barrier 5 of Kawahara, as shown in Figs. 4C-4E the potential barrier 5 is deeper during the read-out step than times except said read-out step shown in Figs. 4A, 4B, 4F, and 4G).

In regards to claim 14 see examiners notes on the rejection of claims 2 and 13.

In regards to claim 17 see examiners notes on the rejection of claim 13.

In regards to claim 18 see examiners notes on the rejection of claims 2 and 17.

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Claims 5, 6, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 4,696,021 to Kawahara et al) in view of (Applicant's admitted prior art) in further view of (USPN 5,903,021 to Lee et al).

In regards to claim 5 see examiners notes on the rejection of claims 1 and 9. Note that Kawahara does not teach to have a vertical OFD. Applicant's admitted prior art does teach to have a vertical OFD, however there is no explicit motivation in applicant's admitted prior art to use applicant's admitted vertical OFD in Kawahara's invention. Lee et al, herein Lee, teaches that either a lateral or vertical OFD can be used where in using a vertical overflow drain uses less photodetector area and thus increases the fill factor (column 6, lines 40-56 Lee). Therefore it would have been obvious to one of ordinary skill in the art to have used a vertical OFD in Kawahara's invention instead of a lateral OFD in order to increase the fill factor.

In regards to claim 6 see examiners notes on the rejection of claims 2 and 5.

In regards to claim 15 see examiners notes on the rejection of claim 13.

In regards to claim 16 see examiners notes on the rejection of claims 2 and 15.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached by phone at 703-305-7881 or by fax at 703-746-8325. The examiner can normally be reached on Monday thru Friday 8:30am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the customer service office whose telephone number is 703-308-4357.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

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have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian C Genco
Examiner
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July 8, 2004

A handwritten signature in black ink, appearing to read 'Andrew Christensen', with a long horizontal flourish extending to the right.

ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600